UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,163	06/26/2003	Donglai Dai	499.748US1	5632

21186 7590 10/23/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
MITCHELL, KEITH OLINGA	

ART UNIT	PAPER NUMBER
2153	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,163	DAI, DONGLAI	
	Examiner	Art Unit	
	Keith O. Mitchell	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. No information disclosure statement was filed with this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 6, 8, 9, 11, 14, 16, 18-19, 21, 24, 26, 28, 29 are rejected under 35 U.S.C 102 (b) as being anticipated by US Patent No. 6067567 to Bartfal et al hereafter referred to as Bartfal.

With respect to claim 1, Bartfai anticipates a parallel processor computer interconnect router, the interconnect router comprising:

a multicasting module operable to receive a single incoming multicast packet comprising a destination identifier identifying a plurality of destination nodes, (see abstract and fig. 3 where a distribution node receives a message from a primary node. This message that the distribution node receives is taken as an incoming multicast packet as it indicates the nodes that need to also receive the message)

and to output multiple unicast packets, each of the multiple unicast packets comprising a destination header identifying a single destination node from among the plurality of destination nodes; (see abstract where the distribution nodes send messages to multiple nodes. These messages are taken as unicast packets because a copy is sent to each node. The message packets also inherently have the equivalent of a destination header since the distribution nodes create a list of the nodes to receive the packet as shown in fig. 3A - 320),

and a gathering module operable to receive unicast reply packets from the plurality of destination nodes (see abstract and fig. 3A - 326, where the distribution nodes collect their respective acknowledgements) and to output a combined multicast reply packet (see abstract and fig. 3A - 328, where the distribution nodes sends one acknowledgement to the primary node).

With respect to claim 11, Bartfai anticipates a method of routing packets via a router in a parallel processing computer interconnect network, comprising:

receiving in the router an incoming multicast packet comprising a destination identifier identifying a plurality of destination nodes; (see abstract and fig. 3 as described in claim 1)

outputting from the router multiple unicast packets, each of the multiple unicast packets comprising a destination header identifying a single destination node from among the plurality of destination nodes; (see fig. 3A – 320 and the abstract as described in claim 1)

and receiving in the router unicast reply packets from the plurality of destination nodes, and; outputting from the router a combined multicast reply packet. (see abstract and fig. 3A – 328 as described in claim 1).

With respect to claim 21, Bartfai anticipates an information handling system comprising multiple processors connected via an interconnect network and at least one router, the router comprising:

a multicasting module operable to receive a single incoming multicast packet comprising a destination identifier identifying a plurality of destination nodes, (see abstract as described in claim 1),

and to output multiple unicast packets, each of the multiple unicast packets comprising a destination header identifying a single destination node from among the plurality of destination nodes; (see abstract and fig. 3A as described in claim 1),

and a gathering module operable to receive unicast reply packets from the plurality of destination nodes, and to output a combined multicast reply packet (see abstract and fig. 3A as described in claim 1).

With respect to claims 4, 14 and 24, Bartfai anticipates the parallel processor computer interconnect router of claim 1, the method of claim 11, and the information handling system of claim 21, wherein the output combined multicast reply packet is routed to a reply destination node designated by the single incoming multicast packet (see fig 3A – 324, where the nodes send acknowledgement to the distribution nodes. These nodes that send the acknowledgements must be told where to send the acknowledgements when they receive the packets or the destination of the acknowledgements would be unclear).

With respect to claims 6, 16 and 26, Bartfai anticipates the parallel processor computer interconnect router of claim 1, the method of claim 11, and the information handling system of claim 21, wherein the output combined multicast reply packet is routed to a reply destination node that is a node other than the node sending the single incoming multicast packet., wherein the output combined multicast reply packet is routed to the node sending the single incoming multicast packet (see abstract, fig. 3A – 326 and col. 6, lines 42-45, where the acknowledgements are collected and sent to primary node).

With respect to claims 8, 18 and 28, Bartfai anticipates the parallel processor computer interconnect router of claim 1, the method of claim 11 and the information handling system of claim 21, wherein the gathering module comprises a gather buffer which is allocated to gather unicast reply packets if a gather buffer is available (see fig. 3A – 326 where the distribution nodes collect acknowledgements. These acknowledgements are collected and must be stored for some temporary period of time before being forwarded to the primary node. This temporary storage is taken as a gather buffer as mentioned in the present application).

With respect to claims 9, 19 and 29, Bartfai anticipates the parallel processor computer interconnect router of claim 8, the method of claim 11, and the information handling system of claim 28, wherein the gather buffer is allocated if available on receipt of incoming multicast packets that indicate a multicast with gather is desired (see fig. 3A-322, 326 and clm. 8 above,

the distribution node uses a buffer (or an equivalent) to collect acknowledgements after a multicast).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-3, 12-13 and 22-23 are rejected under 35 U.S.C 103 (a) as being unpatentable over Bartfai in view of US Publication No. 20020107935 to Lowery et al hereafter referred to as Lowery.

6. With respect to claims 2, 12 and 22, Bartfai anticipates the parallel processor computer interconnect router of claim 1, the method of claim 11, and the information handling system of claim 21 respectively, but does not teach that the single incoming multicast packet comprises a cache invalidation message.

Lowery teaches the use of data expiration commands made up of messages (see para. 47-48) that inform cache modules that particular content has expired. These expiration commands are taken to be the equivalent of invalidation messages.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bartfai's invention to distribute messages to the caches as described in Lowery.

The motivation for doing so would have been to provide Bartfai with a message distribution technique for invalidating cache pages (see para. 47-48).

With respect to claims 3, 13 and 23, Bartfai as modified in claim 2, discloses the parallel processor computer interconnect router of claim 2, the method of claim 11, and the information handling system of claim 21 respectively, wherein the unicast reply packets comprise cache invalidation acknowledge packets. In Bartfai, fig. 3A-324 details that nodes send acknowledgements to their respective sender. As a result, Bartfai's modified invention would entail that the cache send acknowledgement packets because these packets are used to indicate receipt of the message (also see col. 1, lines 20-24 of Bartfai).

7. Claims 5, 15 and 25 are rejected under 35 U.S.C 103 (a) as being unpatentable over Bartfai in view of US Patent No. 7013157 to Norman et al hereafter referred to as Norman.

Bartfai discloses the parallel processor computer interconnect router of claim 1, the method of claim 11, and the information handling system of claim 21, but does not teach that the output combined multicast reply packet is routed to a reply destination node that is a node other than the node sending the single incoming multicast packet.

Norman teaches the selection of a receiver to acknowledge a message. (see abstract and col. 2, lines 15-20). The present invention uses the same principle. Norman teaches the

selection of a different receiver for acknowledging the message and the present invention teaches that another node is chosen for receipt of the acknowledgment.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bartfai's invention to respond to messages as described in Norman.

The motivation for selecting a particular node for this task would is that the new receiver is able to operate in the event that the previously selected receiver (which would be the source in the current application) is either inactive or inoperative (see col.2, lines 15-20 to Norman).

8. Claims 7, 17 and 27 are rejected under 35 U.S.C 103 (a) as being unpatentable over Bartfai in view of US Patent No. 6754716 to Sharma et al hereafter referred to as Sharma.

Bartfai discloses the parallel processor computer interconnect router of claim 1, the method of claim 11, and the information handling system of claim 21, but does not disclose that this router is associated with a local plurality of processors comprising a subset of processors in a parallel processor computer system, and creates multicast packets only for processors locally known to the router.

Sharma teaches that a network device in a communications network only responds to other network devices whose addresses are authorized (see clm. 11 to Sharma). The present applicatio uses the same principle where the locally known processors, i.e. the authorized processors, are the only processors that receive the created multicast packets

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bartfai's invention to distribute messages to locally known processors as described in Sharma.

The motivation for doing so would have been to provide Bartfai with an ability to control how the router communicates with the processors (see col. 1, lines 60-63 to Sharma).

9. Claims 10, 20 and 30 is rejected under 35 U.S.C 103 (a) as being unpatentable over Bartfai in view of US Publication No. 20030214954 to Oldak et al hereafter referred to as Oldak.

Bartfai discloses the parallel processor computer interconnect router of claim 9, the method of claim 191, and the information handling system of claim 29, but does not teach that the incoming multicast packets that indicate a multicast with gather is desired are converted to a multicast without gather if a gather buffer cannot be allocated.

Oldak teaches that when a buffer is full it drops any additional incoming packets (see para. 37). The present application uses the same principle. A buffer that cannot be allocated can be taken as a full buffer and a full buffer would drop incoming packets effectively converting a multicast with gather to a multicast without gather.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bartfai's invention to allow for the conversion of a multicast with gather to a multicast without gather.

The motivation for doing so would have been to provide Bartfai with an effective way of dealing with incoming packets in the event that the buffer becomes full (see para. 37 to Oldak).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith O. Mitchell whose telephone number is 517-270-1134. The examiner can normally be reached from Monday to Friday from 7:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

***

10/10/2006

WILLIAM VAUGHN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

William Vaughn